Invisible Joints—Strong, Trim, Simple

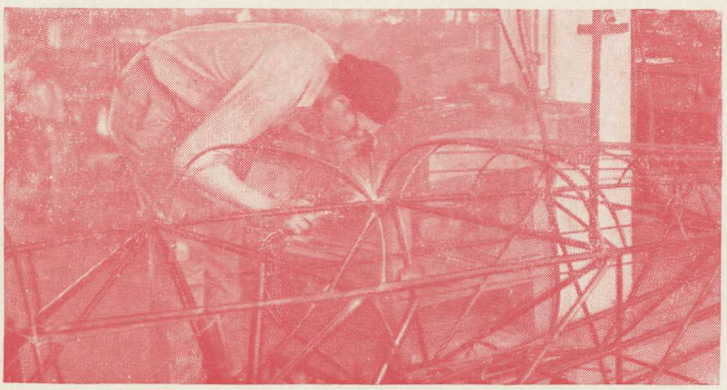
Oxy-acetylene Welding contributes these important advantages to the design and manufacture of metal products.

By W. B. MILLER*

IN THE fabrication of metals it is not necessary to sacrifice appearance and simplicity for strength. Modern methods have changed that. Through the use of welding, it is now possible, with a minimum investment in equipment, to fabricate products with strength where it is wanted. Extra bulk throughout for reinforcing the weakest spot is not necessary.

Welded for Strength

The welded joint is as strong as or even stronger than the metal it joins. It is leak-proof and thus admirably suited for piping or containers of any sort, to resist pressure, temperature, or shock. Another way of making the product stronger is to weld it from one of the new alloy steels or strong non-ferrous alloys. In this way another desirable property is usually obtained — lighter weight. Welding can be used to make joints in any of the commercial metals.



STRONG JOINTS—95 per cent of all aircraft have oxy-acetylene welded fuselages, wings and other members.

In Aircraft Construction

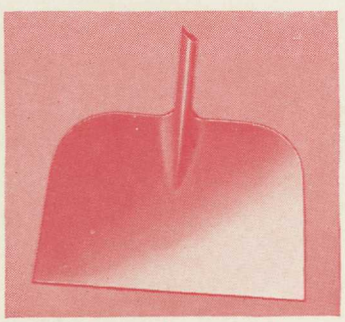
Outstanding as an example of the use of welded joints for their strength is in aircraft manufacture. In an airplane fuselage, every joint must be strong enough to withstand heavy stresses from all sides in flying. The joints must be tough also, for the shocks they undergo are sudden as well as powerful. They are made in a strong alloy—chrome-molybdenum steel. Welded joints are the standard of the aircraft industry because they fulfill faithfully these essential requirements on which so many human lives depend.

For Rigorous Use

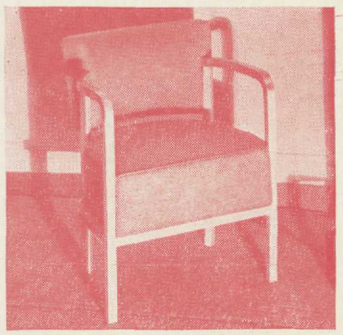
For years, field hoes were manufactured by a forging and rolling process involving a considerable investment in machinery. An enterprising hoe manufacturer found that he could eliminate inherent weaknesses by welding. He designed a bimetal job: the hoe blade of a steel made to hold its cutting edge longer, the sturdy shank of a steel selected for its ability to withstand shock and fatigue. These are then joined by welding with a bronze welding rod. In this way there is no compromise—materials are chosen for the job they are to do—and the manufacturer makes a better hoe at lower cost.

In Modern Furniture

In making metal chairs it is necessary to get a strong ductile joint and one smooth in contour to take the various special finishes which are applied to simulate wood. The strength of joints made with special high strength welding rod can support the weight of several stout men without any sign of giving way. The welded joints are rounded and curved so that but little grinding is necessary for a smooth surface.



SIMPLE—by adopting welding for these field hoes, the manufacturer produces a product with none of the disadvantages of older designs.



TRIM JOINTS—for metal furniture are made by welding. Chairs of welded metal easily support as many heavyweights as can hang on.

Welding Is Sound Design

To take advantage of all the features of oxy-acetylene welding, products should be designed or redesigned with the aid and advice of competent welding specialists. Engineers of The Linde Air Products Company are constantly perfecting details of ox-welded design which are of interest and assistance to manufacturers. Consultation on welded design can be had without charge from any Linde Sales Office. They are located in leading cities of the country: Atlanta, Baltimore, Birmingham, Boston, Buffalo, Butte, Chicago, Cleveland, Dallas, Denver, Detroit, El Paso, Houston, Indianapolis, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Phoenix, Pittsburgh, Portland, Ore., St. Louis, Salt Lake City, San Francisco, Seattle, Spokane and Tulsa. Everything for oxy-acetylene welding and cutting—including Linde Oxygen, Prest-O-Lite Acetylene, Union Carbide and Oxweld Apparatus and Supplies—is available from Linde through producing plants and warehouse stocks in all industrial centers.

With Engineering Cooperation

Users of oxy-acetylene welding and cutting, and other products and processes developed by Units of Union Carbide and Carbon Corporation benefit from a most unique coordination of scientific research with manufacturing, sales and service facilities. These combined resources of a vast organization assure a full measure of satisfactory performance.

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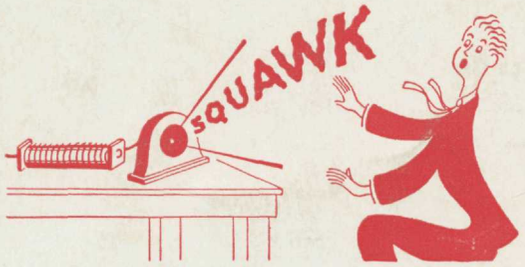
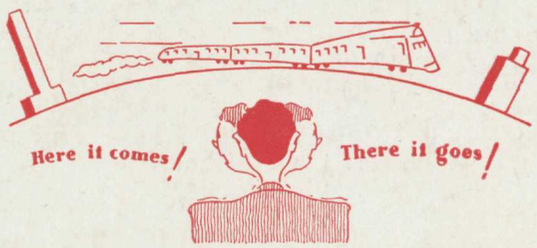


MAKING FLAWS SQUAWK

A VALVE used in a General Electric refrigerator unit requires a small steel spring, which, during the time that a refrigerator is in operation, is used several hundred times per minute. A small defect, even a microscopic scratch, would be sufficient to cause the spring to fail after a relatively small number of operations. Consequently a fast, certain means of inspection for the steel ribbon of which the springs are made was necessary.

It is generally known that, if a secondary coil is placed around a core of iron and the iron is placed in a magnetic field, there is a definite relation between the chemical and physical properties of the iron and the resultant electrical wave induced in the secondary coil. Using this knowledge as a base, a General Electric laboratory built an inspection device. The spring material is run through a magnetic field, and the induced current is fed through an amplifier to a loudspeaker. A hum peculiar to the magnetic properties of the material sounds in the loudspeaker as long as the quality of the material is uniform. Any flaw, however, changes the magnetic properties, the magnetic field then becomes unbalanced, and the loudspeaker emits a shrill squawk.



STREAMLINE COMMUTING

PORTLAND-BOSTON commuters will shortly receive a taste of real speed. Fairly before they have a chance to swallow their breakfasts, they will be whisked into North Station by the "Flying Yankee." In the morning, the train will streak the 115 miles from Portland, Maine, to Boston in 110 minutes. Then during the day, it will make a round trip to Bangor, Maine, making the 250-mile trip each way in 265 minutes. When the business day closes, it will streak back up Portland way with the commuters it brought down in the morning.

The "Flying Yankee" is a 200-foot articulated train, of lightweight, stainless-steel construction. Its three sections are carried on four trucks. Power originates in a 600-horsepower Diesel engine, directly connected with a General Electric generator. Two General Electric traction motors are mounted in the first truck. An auxiliary generator and the control equipment are also built by General Electric.

HOT DOG

PEG is an elderly English setter, who can trace her family back to some of the very best nobility in her breed. When she was younger, she enjoyed nothing more than romping about in the snow. But in the last few years, American winters, with all their sub-zero weather, have not agreed with her too well.

So last year, her owner, H. C. Ward, U. of Wisconsin, '05, of the General Electric office in Rochester, N. Y., decided to heat her kennel. Quite appropriately, he decided to do the job electrically. He installed a length of G-E soil-heating cable, plugged it into an outlet, and turned on the juice.

He did not stop there, however. Such a fine old dog deserved a polished job. He also installed a G-E thermostat in Peg's quarters to keep the temperature constant through all kinds of weather. Now while other dogs cower in frosty kennels, she disposes herself in luxury. She wags her thanks to General Electric.

96-138DH

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